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DEDICATION ADDRESS FOR WILLIAM A. GELLERSEN ENGINEERING AND MATHEMATICS BUILDING

Valparaiso University

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by

James M. Beggs
Associate Administrator for Advanced
Research and Technology

Dedication Address for
William A. Gellersen Engineering and Mathematics Building
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It is indeed an honor to take part in the dedication of the William A. Gellersen Engineering and Mathematics Building. In these days of demands for expanding Federal assistance to education, it is inspiring and refreshing for me, as a Federal official, to speak at the dedication of a building made possible largely through the private and generous gift of William A. Gellersen. His contribution of a million dollars plus a facility grant of the Department of Health, Education and Welfare of $434,000 will provide modern facilities for the engineering and mathematics departments. The Gellersen Center and the new modern Foreign Languages Building, also dedicated today, reflect the growth and potential of Valparaiso University in preparing young men and women for the future.

According to his friend and Lutheran pastor, Rev. Alfred W. Koehler, Mr. Gellersen had an independent nature who made his own way by determining by and for himself what had to be undertaken. Sounds a little like Wally Schirra, doesn't he? Mr. Gellersen was neither an engineer nor a mathematician but a businessman. In his long and distinguished career in food production, processing,

distribution and sales, he is credited with helping to develop the pineapple industry in Hawaii, chiefly on the island of Molokai.

This industry is closely linked with science and technology. Pineapple production depends upon a paper mulching technique in starting the plants plus a continuous balancing of the chemical elements of the soil and use of insecticides and pesticides to assure vigorous and healthy growth. The industry marked its beginning when James Dole developed a successful canning method in 1903 and canned about 2,000 cases. Today about 30 million cases are canned each year with a value of about 125 million dollars, making it the second most important industry in Hawaii. The rise of the pineapple industry is a typical example of how technology and the initiative of private enterprise have made this country great. Teamwork between Govt & private enterprise Envy & wonder of the rest of the world

Technology has played a strong role in America's growth from the beginning. The steamship, the railroad, and the telegraph played prominent roles in the early growth of our Nation. But it was during the life span of William Gellersen and the continuing one of Valparaiso University that technology emerged as a major driving force in our economy.

Following the Civil War and through World War I, technology expanded rapidly. For example, between 1859, the year this great

university was founded, and 1919, American industrial production mutliplied thirty-three fold. The population trebled during this period but those engaged in technology and industry multiplied seven-fold. This thirty-three fold increase in production with a seven-fold increase in manpower shows the progress of mechanization.

In 1876, four years before William Gellersen was born, the first American International Exhibition informed the world of the rapid strides America was making in technology. A most significant factor in this progress was the interchangeability of parts of manufactured products, essential to mass production and use. This was followed by development of a scientific and rational system of works management. A report in 1890, for example, cited the Westinghouse Company's plant which made castings for train air brakes. The plant featured a moving-belt production system, an innovation adopted and used so successfully later by Henry Ford in producing automobiles.

By the turn of the century, when William Gellersen began his career in food processing and sales with Libby, McNeill, and Libby, the federal government began to sponsor applied research, industrial laboratories began to appear, and universities remained the haven for pure science. World War I produced a profound change in these

patterns by using teams of scientists and engineers to attack the problems of warfare. This interdisciplinary approach was the forerunner of the modern research method. Industrial research began expanding rapidly. By 1920, industrial laboratories numbered 300; by 1930 the number had grown to 1, 625. By 1940, the country was spending 345 million dollars annually in R&D with the private sector contributing 80 percent.

World War II brought a large surge of effort in science and technology. By its end, the same year William Gellersen retired, the United States had established itself as the world leader in scientific and technological competition, and continues to hold this leadership. If continue determination & motivation Science Nobel prize Sweep

By 1950, the expenditures for R&D had increased almost tenfold over 1940. Today, R&D has grown to over 20 billion dollars annually with about eighty percent coming from Federal funds. The United States leads the western world in spending over 3 percent of its gross national product on R&D but it has been estimated that Russia spends about this same proportion on R&D.

What does all this growth in technology mean?

To the Europeans it means an economic invasion of Europe by the United States. In his recent book "The American Challenge", Servan-Schreiber points out the "American industry produces twice the goods

and services of all European industry combined... It produces a third of the total production of all other countries in the world. The Americans have achieved this with only seven percent of the surface of the globe and six percent of its population... All by themselves the Americans consume a third of the world production of energy and has one third of all the world's highways. Half the passenger miles flown each year are by American airlines... Americans own three out of every five automobiles in the world." He adds "Advanced technology and management skills have raised per capita production in the United States to a level 40 percent above that of Sweden (next highest) 60 percent above Germany, 70 percent above France, and 80 percent above Britain." These statistics make a strong case for an extensive research and development program by both the government and the private sector.

To some like Lewis Mumford ~~the~~ and William Ferry, however, technology represents a danger. In "The Myth of the Machine" Mumford questions the part that technology plays in human development. He believes "megatechnics", as he calls big technological efforts, will lead to man as "...a passive, purposeless, machine-conditioned animal whose proper function, as technicians now interpret man's role, will either be fed into the machine or strictly limited and controlled for the benefit of depersonalized collective organization."

Ferry believes that overinfatuation with science and technology is bottomless and argues that we must control technology before it controls us.

To others, technology at best represents too much attention to the production of goods and services and not enough on social problems. Many are quick to point out the growing social problems brought on by technology including pollution of our air and streams, crowding of our highways and in our cities and the mounting problems of the disposal of waste from an affluent society.

To me, a steady growth in science and technology, in proper balance and perspective with other national needs, is crucial to our continued progress. I would couple this growth to advancement in the social sciences so that science and technology become part of the larger process of living and working together in an increasingly complex environment. I believe that space exploration offers a powerful and peaceful stimulus for the growth of science and technology with many benefits to all of us.

William Gellersen died on August 31, 1964. I do not know of his interest in space exploration but he lived to experience with all of us the early excitement of space flight including the manned flights of Shepard, Grissom, Glenn, and Cooper. We are now in the eleventh

year of space exploration. Consider some of the highlights of what has been accomplished:

- o A world-wide communication network by satellite organized and operated on a commercial basis. Live TV broadcasts of significant events from one continent to another is now commonplace.
- o A world-wide meteorological network created and turned over to the Environmental Sciences and Services Administration. Forty countries have automatic picture taking equipment and can get local cloud cover data direct from our Nimbus satellite.
- o A greatly increased understanding of our earth and its space environment through measurements by scientific satellites such as the Explorers, Pioneers, Interplanetary Monitoring Probes, and others.
- o Breathtaking reconnaissance photographs of the moon by five Lunar Orbiters and unmanned landings of five Surveyor spacecraft with close-up photographs of the lunar surface and tests of its soil characteristics. 1 million to 1 over last astronaut photos
- o Mariner flights to Venus and Mars, measurements made near their vicinity, and pictures of the Martian surface.

- The growth in technologies that provide the foundation for future space missions and which stimulate applications on earth including results from the Application Technology Satellites which show the potential of identifying and making better use of the earth's resources.
- The wonderful and successful man space flights that started with Mercury, followed by Gemini, and, just concluded, the first and highly successful manned flight of the Apollo series with lunar landing as the objective. The flight of Schirra, Eisele, and Cunningham not only demonstrated our technical capability but the indominable spirit and humor that is uniquely American.

These are the visible and readily apparent results; the results you read about in headlines. But what is more important are the stimuli that space exploration provides in advancing knowledge and developing skills. The impact of these forces will be felt in all parts of our society and in activities totally unrelated to space. High on the list of the lesser-known accomplishments of space exploration is the involvement of the academic community in the aeronautics and space program. Did you know, for example, that over half of all experiments flown on NASA satellites have been generated by scientists, engineers

and graduate students in our universities? Over 250 universities have been involved in the NASA program; by 1970 over 4,000 doctorates will have been earned by men and women through NASA grants. In addition, more than 500 graduate degrees have been earned by NASA employees. Altogether, from 1959 through 1967, NASA has ~~funneled~~ invested over two billion dollars into universities to support these activities.

The returns from this involvement in terms of new knowledge, trained people and new capabilities for research, education, and service are incalculable.

This week, I read an interesting article in the Baltimore Sun about the new science city, Akademgorodok, that the USSR has established in the wilderness of Siberia. It now covers 40 square miles, has 44,000 inhabitants, 200 million dollars in research facilities for 20 institutions, and an university. There are over 8,000 research scientists supported by 12,000 engineers and technicians. The city is controlled by the Russian Academy of Sciences and its leader is Professor Lavrentiev.

He believes that a large group of research scientists, professors, and students living and working together in an environment that stresses freedom of scientific investigation will interact in a

manner to greatly accelerate the advancement of knowledge and skills. It is a highly interesting, unique, and large-scale experiment in the interdisciplinary approach to research.

In summary, the strength of the United States lies in its youth and their development of knowledge and skills. One third of all students in the world pursuing a higher education are American. I believe that the goals and objectives of space exploration stretch the imagination, create enthusiasm, and attract talented people from many diverse backgrounds and interests to work together on common problems. This not only promotes the general advancement of science and technology but also produces innovations in solving new problems of space flight and provides fresh approaches to age-old problems here on earth.

The past has been exciting; the future lies bright before us. In closing, I am reminded of the words of Carl Sandburg when he was asked the meaning of the inscription "What is Past is Prologue" on the National Archives Building in Washington. His reply: "It means you ain't seen nothing yet!"